

Notice of Allowability

Application No.

10/669,561

Applicant(s)

EZAKI ET AL.

Examiner

Tuan T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-26.
3. ☒ The drawings filed on 29 January 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

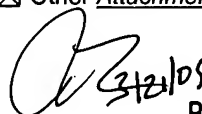
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 2/20, 4/09, 10/01/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other Attachment A: Search History.



RICHARD ELMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 2/20/04, 04/09/04, and 10/01/04 were filed after the mailing date of the present application. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Examiner's Amendment

3. The application has been amended as follows:

In the Abstract, delete the last line "[Selected Drawing] Fig. 2"

Claim 6, line 4, change "said pair of read lines" to "said pair of first read lines"

Claim 7, line 6, change "second read lines" to "a pair of second read lines"

Allowable Subject Matter

4. Claims 1-26 are allowed.
5. The following is an examiner's statement of reasons for allowance:

The prior art of record fail to disclose a magnetic memory device comprising, in combination with other cited limitations, a plurality of magnetoresistance elements each including alamineate including a magnetosensitive layer having a magnetization direction variable in accordance with an external magnetic field and adapted to allow an electric current to flow in a direction

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perpendicular to a laminated surface of said laminate, and an annular magnetic layer disposed on one surface side of said laminate so as to have an axial direction along said laminated surface and adapted to be penetrated by said first and second write lines; wherein each memory cell is formed to include a pair of said magnetoresistance elements as recited in claims 1-21.

The prior art of record further fail to disclose a method for writing on a magnetic memory device having structure as cited in claim 1, comprising steps of writing information into said memory cell by changing said magnetization directions of said magnetosensitive layers in said pair of magnetoresistance elements to be antiparallel to each other due to magnetic fields generated by electric currents flowing through said first and second write lines penetrating said annular magnetic layers as recited in claim 22.

The prior art of record also fail to disclose a method for reading from a magnetic memory device having structure as cited in claim 1, comprising steps of supplying read currents to said pair of magnetoresistance elements in a direction perpendicular to laminated surfaces of laminates of said magnetoresistance elements respectively; and reading information from said memory cell in accordance with said currents flowing through said laminates as recited in claims 23-24.

The prior art of record also fail to disclose a magnetic memory device, in combination with other cited limitations, comprising a plurality of magnetoresistance elements each including laminate including a magnetosensitive layer having a magnetization direction variable in accordance with an external magnetic field; each memory cell being formed to include a pair of said magnetoresistance elements; a pair of read lines for supplying read currents to said

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pair of magnetoresistance elements of said memory cell respectively; a reading circuit for reading information from said memory cell in accordance with a difference between a pair of values of said read currents supplied to said pair of magnetoresistance elements through said pair of read lines respectively; and a constant current circuit having a current regulating function for regulating a total sum of read currents flowing through a pair of magnetoresistance elements in each memory cell as recited in claims 25-26.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Okazawa (US 6,643,168) discloses a nonvolatile magnetic storage device having first wiring and second wiring conductors.
- b. Perner et al. (US 6,643,213) disclose a write pulse circuit for a magnetic memory .
- c. Hirai (US 6,587,370) discloses a magnetic memory having variable resistor.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Nguyen whose telephone number is (571) 272-1880.

The examiner can normally be reached on Monday - Friday, 7:00 AM - 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



March 21, 2005

Tuan T. Nguyen
Patent Examiner
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